

Unequal Twins, Asymmetrically Coupled

Creating and Performing an Interactive Movement- and Sound-Piece

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The piece *Moving Music* is a collaboration between a dancer and a musician with the goal of investigating the principles underlying movement-sound relationships. The central method for this endeavour is artistic creation with a special focus on reflection and analysis. The aim is transformation of experience by exposing established artistic methods of dance- and music-making to the constraints of technical coupling.

Performing arts, in particular non-theatrical work with movement and sound, poses a unique set of questions regarding process, work, and reflection. In a configuration intending to investigate the intersections and relations between fundamental elements of sound and movement that bridge the disciplines of music and dance, idiomatic conventions must be set aside and underlying principles uncovered and worked with. The use of movement-sensing technologies inverts the conventional interdependence between music and dance, and interrogates processes that occur when intersecting the two disciplines.

Artistic research methodology postulates the generation of »insight and understanding« (Johnson 2011: 150) through an extended practice within an artistic discipline. In order for this to happen, it is necessary to add a dimension of reflection and analysis not just after the experience (the doing), but as an integral part of the process. Interwoven into practice it needs to be part of each step in the artistic work.

The present article investigates the validity of examining the fundamentals of movement to sound relationships with research carried out through artistic practice. It addresses ways in which the performative and the reflective complement each other and enable a particular kind of insight that cannot be reached in either of the two domains. The artistic process becomes an experimental device (Rheinberger 1992), or dispositive (Foucault 1980; Agamben 2009), as-

ssembled in order to address underlying questions through a mixture of perspectives.

The intention that we put down in our project notebook in April 2015 is to make a piece of music, where the dancer is the interpreter, without necessarily being/becoming a musician, but where the (musical) form, energy and dynamics originate from the performer. The core issue is how this connection influences the creation of choreography, musical composition, and dance performance. Can the dancer simultaneously be composer and choreographer? Can a relationship be established that is perceived as unified by the audience? How does perception of movement and sound change when the two are coupled through technical means? How can qualities be translated from movement to sound? And finally, how can the sensation of listening to movement be achieved?

The two disciplines only share a limited set of fundamental characteristics and principles. Whereas dance and movement is inherently multi-dimensional, multi-modal, and based to a high degree on human factors (Kozel 2011), technical processes of electronic sounds are based on models of mathematical abstraction and formalisation (Xenakis 1992).

Moving Music is embedded within a practice of electronic music that leverages interaction technologies as well as real-time sound generation. It is also situated in the fields of interactive dance with technological means, as well as compositional and choreographic practices in open forms. The development and scoring process for this piece is based on shared experiences and agreements rather than notation and prescriptive instructions. It starts with an open exploration using motion sensors and movement tracking with a camera and looks for qualitative differences in effort and dynamics in a single, fixed movement phrase. These initial sketches serve as a basis for testing subsequent mappings between movement and sound.

A method is established that oscillates between exploration and reflection. By iterating this cycle, the advances in concepts, ideas, and insights lead to the realisation that only real-life *play* situations may condense sketches into full, multi-layered experiences. Bringing all of the elements into action in these test-performances, sometimes with a small audience, enables evaluation and further dialogue. Post-performance discussions are essential for this method and inform decisions on how to modify the process, the interaction modalities and parameters, as well as the musical and choreographic approaches. Members of the test-audiences, researchers and artists themselves, provide valuable feedback to central questions, for example by pointing out the difficulty in reading the technological link.

The first part of *Moving Music*¹ focuses on temporal units and dynamics. In the body, peripheral movements initiated from the arms or legs best express the theme of time. It manifests in rhythmical modulation of movement, and more or less accentuated impulses. In order to connect to sound, movements are captured with wireless sensors placed on wrist and ankle. The mapping applies this data to amplitude-envelopes that increase and decrease the volume of sound in function of the motion energy (see upper left of Fig. 1). In order to smooth out and extend the sometimes abrupt, instantaneous energy peaks, inertia is introduced, which results in sounds that fade out more slowly than the movements. Two sensor-sound pairs operate in parallel and generate a polyphonic sound reaction. The fact that one arm and one leg remain un-tracked allows for dance movements that play with silence. A set-up of accumulating movements is decided: a, a+b, a+b+c, a+b+c+d. Eventually, this structure is loosened and the material gets modulated more freely. Phrasing provides a strong link and is possibly the realm where movement and music come closest.

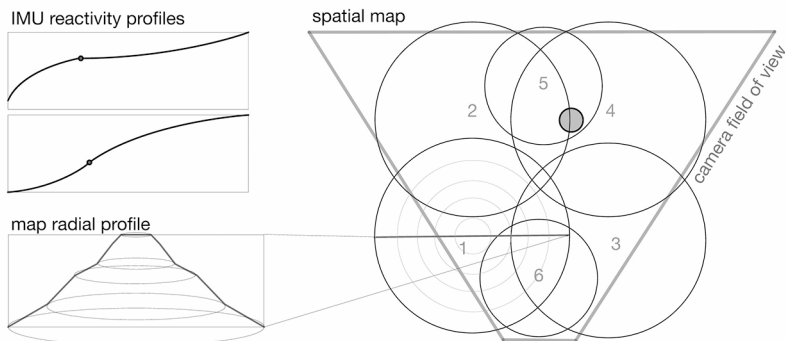


Figure 1: Mapping strategies for *Moving Music*. Graphics: Jan Schacher.

The second part focuses on spatial relationships, movements, and placement. The theme of space, for the body, is implemented by exploring topographical space. In the horizontal dimension this means playing with the borders between the different sound areas, tracing paths from one to the other. In the vertical dimension it leads to the use of different levels. In order to obtain the dancer's position, the stage is observed by a depth-camera located in the front centre of the stage at floor level. Precision of information needs to be balanced with the size of the covered area, which can reach up to seven meters (see right part of Fig. 1). The limited, fan-shaped camera view divides space into active and inactive zones, which become important for controlling sound densities

1 | For a video of the piece see <https://www.researchcatalogue.net/view/254382/318754> (URL accessed 21. February 2017).

and silences. The corporeal presence within overlapping sound-zones generates a polyphony that needs to be negotiated by the dancer.

The third and longest part of the piece mixes the interpretations of time and space and gives more freedom in how to shape the choreography and composition. The dancer is simultaneously creating, listening, and letting herself be surprised by the outcome. Her focus shifts from the corporeal to the auditive, continuously alternating between sound and movement, between actions as triggers and actions as modulation. In addition, she needs to maintain a sense of the developing dramaturgic arc. Her attention shifts through differently shaded states between the corporeal and the auditive, sometimes closer to sound, sometimes closer to movement. This brings about specific psychophysical and mental-kinetic states of *sounding-moving* or *listening-moving*. By simultaneously choreographing and composing she enters into of a kind of dialogue with herself. To trigger a sound through movement while listening to it, then to immediately react by modulating the movement that again produces sounds, leads to a unique cycle of interconnectedness. Independent musical decisions by the musician provide an extra element of direct interaction. Thus the piece creates a field of connections between movement and sound, which are at times so tightly interwoven, that they fuse into a unified sensory perception.

When performing in this way several threefold principles are active: the past informs the approach in the present, which already anticipates the future. The mode of improvised creation (Lampert 2007) generates a constant juggling between past, present and future, as well as a shift between doing, listening, and reflecting. The very first action – being influenced by previous explorations, the current state of the actors, the atmosphere of the given venue, the public's presence – sets the direction for the piece, for the *story* to develop. The performer's awareness is oriented towards elaborating what arises from an inner impulse. At the same time, the flow of the piece requires a readiness to alter intentions at any moment, reacting to impulses from outside. These conditions produce a threefold kind of presence: coming from, living with, and inviting associations and expectations; they feed into what is happening on stage.

The same threefold division also occurs throughout the development and investigation process. The original framing lingers on in the actualisation during the test-performances, providing the basis for evaluation and reflection, which inform the next actualisation. This cycle has interesting consequences for determining artistic autonomy, agency, and decision taking between the two artists. It becomes evident that within the overall development process of this piece moments of decision occur at different times: the musician determines the structures and relationships *before* the performance, whereas the dancer shapes them *during* the performance. Once the piece has been performed, the experiences created and lived, the roles of both become equivalent and the translation can be completed. A proper balance between the musician's

and dancer's agency may only be achieved in a third phase following those of composition, development, and performance: that of reflection.

The dualistic distinction between art works and perceivers has given way to the analysis of the interaction between production and reception. The perception and interpretation of art works has come into focus as a contingent process led by specific interests and conditions (Ursprung 2010: 91, our translation).

In the process of developing and performing this piece, the change in status described by Ursprung does indeed occur. The »contingent process« of perception and interpretation can be traced through the various phases of the project, both for audiences and artists. Even during a performance there is no distinction between production and perception: through hyper-reflection (Kozel 2007) the artists take up both points of view. Likewise, the public is not only perceiving passively: it is their presence, which enables the moment of performance in the first place. The public is being carried through different states of perception, of empathetic listening and kinaesthetic *co-moving*, of *listening to movement* and *seeing sounds*. Perception and interpretation occur simultaneously with the performance, making each person part of the circumstances. By partaking and experiencing the actions, decisions, and dynamics of the piece, they co-construct the piece for themselves. This enactive participation (Dewsbury 2000) – even if merely on a sub-personal and pre-reflective level (Gallagher 2014) – creates the sense of play (Di Paolo et al. 2008; Huizinga 1955) and engagement (Gallagher/Lindgren 2015) that is central to performing (arts).

The dispositive put in place for this piece endows technology with a specific mediating role. In particular it inshapes the relationship between composer and performer, choreographer and musician, instrumentalist and *mover*. In the intertwined dependency of the technical link, the roles of musician and dancer do not conform to conventional patterns. Consequently, the dancer's task becomes a dual one: she shapes the piece as a choreographer through movement and her actions provide impulses to the sound. At times she is a choreographer who also creates the sound-scape, focusing on how her movement is shaped in time and space. At other times she is a composer playing the instrument by means of her body, focusing on the rhythm of sounds, the phrasing, and the musical arcs.

The musical composition is not located on the same level as the open-form choreography developed during the performance. Given that the electronic sound processes, which are *set in motion*, must be defined beforehand, once the performance begins compositional choices have already been made. Accordingly, the musical domain functions on at least two levels.

On the one hand, the choice of sensors, processes, sound materials, and diffusion system, as well as the mapping that connects movement to sounds

represents a complex instrument.² These aspects cannot be completely redefined in the course of the performance. Built on the capabilities, limitations, and affordances for moving, this instrument may be considered to extend to the edge of the movement domain. Its outermost layer is located at the wearable sensors on the skin of the dancer and through the camera covering the space of the stage. Even if the dancer may be considered a part of the musical instrument, she remains the subject who also plays it.

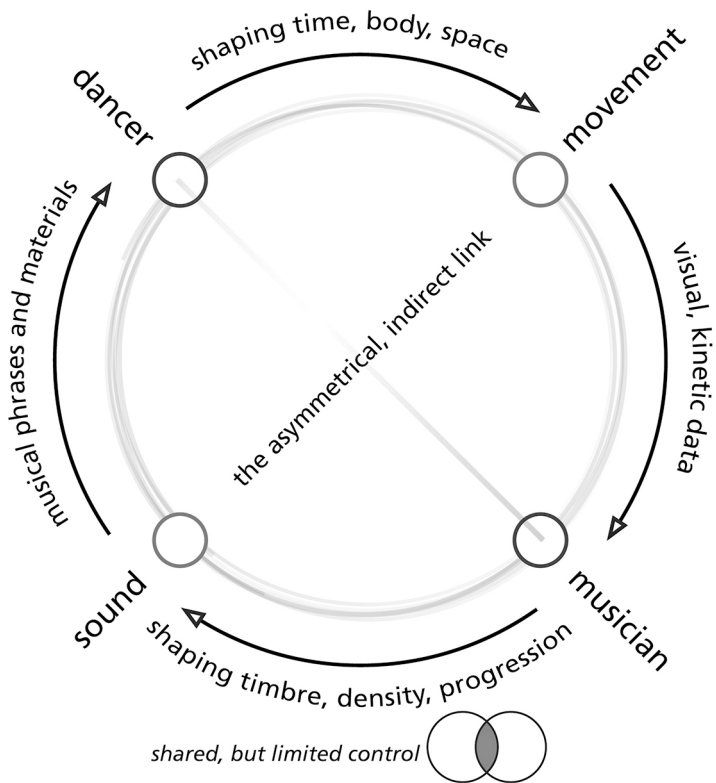


Figure 2: The asymmetrical cycle of influence and shared but constrained control. Graphics: Jan Schacher.

The composition, on the other hand, resides in the movement decisions, the choice of interaction modalities used in the different sections, and the overall dramaturgic arc that was developed in the cyclical process discussed earlier.

2 | This may also be regarded as an instrumentation that is necessary for experimental processes, a technological thing (see Rheinberger 1992).

The choice of musical processes and the ordering in pools of sound-materials according to specific musical characteristics only form part of the composition. The movement syntax becomes an intrinsic part of the composition because the sound generation mechanisms depend on it.

The circular dependency between movement and sound actions blurs the boundaries between musician and dancer. Musical structures, rhythms, mixtures, and developments emerge from the relations between movements that are oriented towards, or avoid, certain responses from the sound system. These responses are in turn optimised to a certain degree for specific movement qualities, thus reinforcing their use. In contrast, some of the sound system's behaviours are deliberately left indetermined, in order to open up a space for surprise and the need to continuously adapt to the unpredictable. The crystallisation of these relationships represents one of the core benefits of the repeated, iterative development process.

In the space of the performance, the body's presence and the sound's presence are by no means equal. The dancer is being perceived as the sole agent of the piece and occupies the focal point of attention. The dancer's state is material, embodied, and fully intersubjective (Merleau-Ponty 1962) and creates a denser kind of presence than the immaterial emissions of electronic sounds. As a consequence, the two domains cannot fuse completely. However, the agency in sound cannot always be attributed to the dancer, mainly because changes and evolutions operate in the sound, which are not perceivable as the consequence of her actions. This is where the musician's presence and co-performing with musical elements comes into play and produces ambiguities.

This leads to the questions about agency, autonomy, individuality, and subjectivity. The configuration of *Moving Music* produces an asymmetrical interdependency between the dancer and the musician, a cycle of shared but limited control, of shared responsibility (see Fig. 2). While during the performance, both dancer and musician are active, the main responsibility for generating the energy of the piece lies with the dancer. The musician seems not to partake in shaping the piece because his principal decision concerning the sound material have already been taken. During the evolution of the piece he does not fundamentally change the interrelationships and dependencies put in place, even though he chooses sound elements and modulates predetermined musical relations. But then again, his active judgements during performance, while guiding the system and taking additional musical decisions, are part of the process and constitute the dialogue with the dancer.

The unequal, asymmetrically coupled agency which is present while performing is a consequence of the way the piece was originally framed, of the questions that were set out at the beginning of the process, and particularly of the choice to base interaction on the technical link between motion and sound. When taken literally, the paucity and limited dimensions provided by motion

sensing technology lead to rigid relations and equally limited expressivity. The constraint, however, has the potential to produce a type of tension and modes of interaction that are unique to working with technical tools in performance. This inherent contradiction can provide a productive base for artistic investigations and exposes some of the fundamental principles that connect movement to sound. It also reflects the conflict that is implicit to living with technology, which is a common state of being today.

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